The Soybean Digest

The Lincoln Soybean

HIGH IN YIELD AND OIL CONTENT

ILLINOIS AND IOWA PROCESSORS MEET

Official Publication
OF
THE AMERICAN SOYBEAN ASSOCIATION

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I Produce Paints, Plastics and Proteins

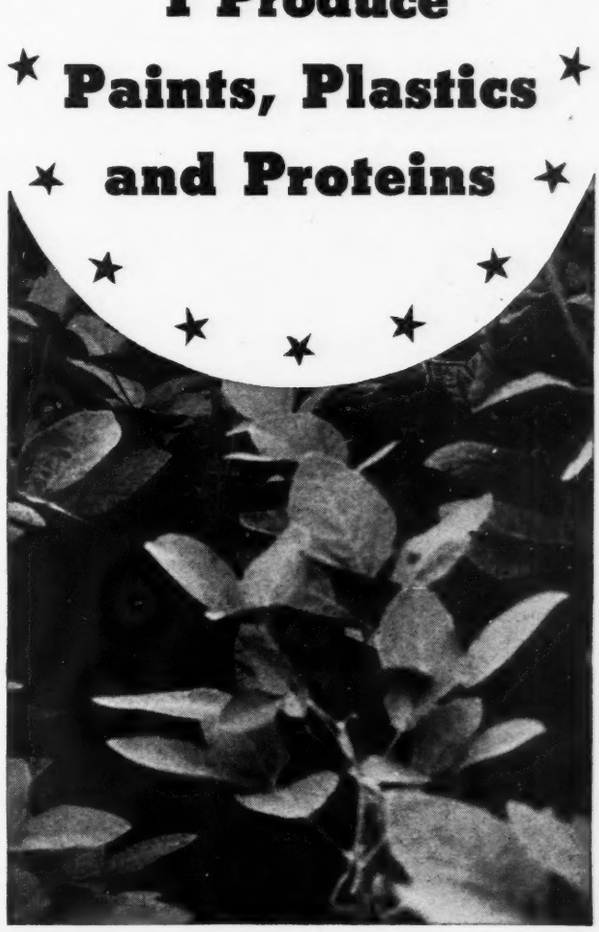
I AM Soy Bean. I am as old as ancient China, where a trading caravan besieged by bandits found that I was good to eat. Yet I am as young as synthetic rubber. Materials made from my oil are better than real rubber for food jar rings, gaskets and many other products because they suffer less from age, air, sun and solvents.

In paints and lacquers my oil lightens the load on scarce linseed and tung oils. In plastics my protein produces steering wheels and ignition parts. For human food my flour goes over-seas at the rate of about a billion pounds a year, besides all its use by people here at home. For livestock feed, my meal amounts to a tonnage as great as the total from linseed, cottonseed and peanuts.

By plant breeding, inoculation and better cultural methods my yields per acre have grown until one state now is able to produce more than a thousand pounds per acre of precious protein meal, plus all the accompanying oil. Most of this progress came between World Wars I and II. In that same period, farm power and machinery added even more to the farmer's capacity to grow and harvest soys. In that same state, tractor and combine enable him now to produce three acres in the time it took for one acre 25 years ago.

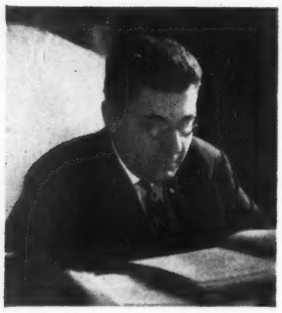
★ ★ ★

Capacity of a farm, a state, or a nation to produce soybeans is measured mainly by the combine capacity available to get the crop harvested before serious losses occur. Case combines, backed by more than a hundred years of experience in saving seeds and grains, are known for capacity where it counts—in threshing at the cylinder, separation of seeds from straw, and cleaning of the beans or other crop. Their endurance enables them to harvest extra acreage in custom work or by "swap-work" among neighbors. J. I. Case Co., Racine, Wis.



CASE

SERVING FARMERS *Since 1842* IN PEACE AND WAR



DR. BERCZELLER

The Dramatic Story of Soy Flour

IT BEGAN IN VIENNA

● *Two Viennese scientists dreamed 25 years ago of feeding the starving peoples of the world with soy flour, then an unknown product. Today their dream is about to come true. Dr. Prinz is now on the staff of Omar, Inc., at Omaha, Nebr.*

By DR. MARTIN V. H. PRINZ

UNTIL about 20 years ago hardly an attempt had been made in the Western World to use soybeans for human food, and with good reasons. The soybean foods eaten in the Far East had been found unsuitable for western palates; and dried soybeans as such were not only almost impossible to cook, but had also a repellent and bitter taste. During the last war a young Viennese physiologist had become fascinated by the possibility of providing better and cheaper nutrition for the starving masses of Europe by adapting the soybean to European eating habits. After several years of experimenting he developed a process by which not only the bitter taste was removed, but also the fat was prevented from turning rancid, even after milling. His product was a cream-colored flour with a slightly sweetish taste and faintly nut-like flavor, which remained stable for many months after milling, though it had the full fat content of the original soybean. His process was very simple and cheap. It consisted essentially in steaming the soybeans for a short time with live steam. He obtained his first patent in 1922. Other people took out patents on other debittering methods, but it was he who started the ball rolling. He was not satisfied with having found a way of adapting the soybean to Western eating habits, he wanted his new food adopted at once, all over the world. He started bombarding governments, scientific institutions, prominent men all over Europe, and even the League of Nations, with letters and scientific papers and pamphlets, describing the extraordinary nutritional value of the soybean and of his new, durable soy flour. He explained that soya protein is the only vegetable protein completely utilized by human digestion and equivalent to animal protein. He figured out how many pounds of meat, how many pints of milk, how many eggs can be replaced in their nutritional value by one pound of his soy flour. Many of the arguments and facts used today originated with him and his collaborators. But he did not stop there.

DR. PRINZ

He developed methods for using his soy flour in the food industry and in institutional and home cooking. He found people with money who formed companies for manufacturing and selling his soy flour, first in Austria and Hungary, then in Holland, England, Germany, Czechoslovakia, and finally in the United States.

I met this man, whose name, incidentally, is Dr. Laszlo Berczeller, in 1927 while studying at Vienna University, and I was as fascinated by his personality and his ideas as everybody who met him. I worked with him as his assistant until I was asked to do the research and scientific publicity for one of the largest of his newly formed companies.

OBSTACLES

The main obstacles in our path were the conservatism of the prospective users, bakers and other food manufacturers as well as managers of restaurants, hospitals, and other institutions, and — last but not least — housewives; and the indifferent or even hostile attitude of the respective governments.

Shortly after Hitler came to power in Germany, however, something very significant happened. The huge and powerful I. G. Farben-trust, a company which controls most of the chemical industry in Germany and was interconnected with most of the chemical industry all over the world, acquired the licence of the Berczeller patents for Germany, Austria and possibly some other countries. Nobody seemed to pay any particular attention, at the time, or to realize what this meant.

It meant, simply and plainly, that Hitler was preparing for war, and was getting ready on the food front as well as on all the other fronts. This was made abundantly clear by the business policy of the new licencees. You would expect a powerful organization, after it has acquired patent rights which it obviously considers to be valuable, or it wouldn't have purchased them, to go full steam ahead with their exploitation; first of all, you would expect it to start a huge publicity campaign in order to create a market for the new product.

Nothing of the kind happened. Instead, the I. G. Farben-trust began promoting the cultivation of soybeans in southeastern Europe.

Now price was no object. Through an agreement between the Hitler government and the governments of some of the Balkan countries, particularly Rumania, the I. G. Farben-trust, undertook to supply machinery and instructors, and obtained the exclusive right to purchase the entire crop of soybeans. During the following years most of the crop was used for seed and the acreage multiplied every year.

However, when war broke out, Hitler had a large supply of soybeans growing right in his back yard. How large this supply was, I do not know, but evidently it was large enough to provide every soldier in his armies with sufficient soy flour each day to maintain health and strength even if he had to go without meat. eggs and dairy products. A special Army Soya Cook Book was issued by the German Army High Command, containing hundreds of recipes which provide for the addition of soy flour to every dish, from soup to nuts. The Nazis had been just as unoriginal and unproductive in this case, as in every other respect: most of the recipes are identical with those we developed 15 years ago. I should like to quote from an article published in the London *Times* on April 23rd, 1940:

"Since the war began there have been frequent references in the press to Soybeans and the so-called Nazi Food Pills. Few people noticing these references will have appreciated the extent to which Germany is now making use of the soya and the importance of the part it plays both in the Nazi food economy and in the general economic structure of the Reich. The soya has become vitally important to Germany from the food, the economic, and the military standpoint.

"As for the food aspect, one of the greatest weaknesses of Germany is the relative lack of foodstuffs of animal origin (meat, milk, eggs). The Germans are facing this weakness by developing from the Soya a flour called Edelsoja, which, because of its high content of good protein (40 to 45%), and of fats and carbohydrates, can completely replace meat or the other animal foodstuffs." (I might remark here, that even the name "Edelsoja" was invented by Dr. Berczeller. It is an intentional analogy to the German words "Edelmetall," meaning precious metal, and "Edelstein," meaning precious stone.) "This flour is introduced in the traditional prepared foods and culinary dishes (soups, sausages, bread, biscuits, macaroni) in such a way that the taste is unimpaired, the protein content greatly increased, and through a daily arrangement of diet the individual receives, without reliance on meat, the minimum ration of protein, fats and mineral salts indispensable for human nutrition. This soy flour is not an Ersatz, not a "food pill," but a new and superior foodstuff. We cannot afford to smile indulgently on German efforts to develop its consumption.

"The flour and prepared products are the ideal military foods and are now an established part of the German army's wartime diet. With soya food preparations the German army can advance in foreign territory without anxiety about food supplies. At the end of the Polish campaign Nazi official circles were boasting in Berlin that without the soya it would not have been possible for the German Army to advance so quickly as it had done."

From this article and from many other publications it appears that many people in Allied countries believe that the use of soy for human nutrition, or the manufacturing of full fat soy flour, or its utilization in the food industry and in cooking, have been invented by the Nazis. Nothing could be further from the truth. They found everything ready and prepared when they took power. All they did was to put the thing into practice on a gigantic scale.

Beans After Corn

• REPORT ON THE YIELD CONTESTS

IOWA and Indiana soybean growers follow very similar cultural practices, but differ widely in the varieties used in the two states.

This is revealed by a comparison of yield contest records. The records for three years in each state were consulted.

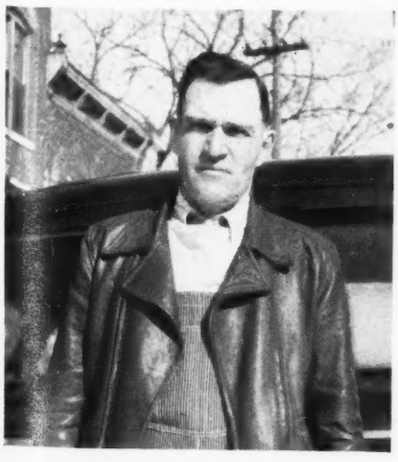
If those who enter the yield contests are typical, the great majority of growers in Iowa and Indiana practice:

1. **Row planting.**
2. **Beans after corn in the rotation.**
3. **Inoculation.**

However, different varieties are popular in Iowa and Indiana, and in Illinois as well, due to different soil and climatic conditions.

Of 40 contest entrants in Iowa in 1941, 36 planted in rows, four solid; in 1942, 19 used row planting, two solid; and in 1943, 15 row planted, while three drilled or broadcast their soybeans. For all three years yield from row seeding was somewhat above that from the other methods.

Similar practices and results are reported for Indiana by K. E. Beeson, secretary-treasurer of the Indiana Corn Growers Association. In 1942, 30 of the 51 contestants used row seedings. Their average yield was 37.4 bushels per acre while from the solid seedings the average was 35 bushels. Dividing the row seedings into two groups, those 36 to 42 inches in width, and those ranging



Bert Kinsinger of Grundy Center was winner of the 1943 Iowa Soybean Yield Contest. His field of Mukdens averaged 38.72 bushels per acre, topping the yield of earlier Iowa champs.

from 19 to 28 inches showed an average yield of 37.9 bushels for the wide rows, and 37 bushels for the narrow. The very favorable season for soybeans doubtless gave the wide rows an abnormal advantage in 1942, for experiment station tests usually show a yield advantage for rows 20 to 30 inches wide rather than greater widths.

In Iowa during the past three years, twice as many growers planted beans after corn as those who placed them elsewhere in the rotation. In Indiana 40 of 51 planted their soybeans after corn in 1942.

Only four Iowa contestants in 1943 and three in 1942 failed to inoculate the seed, although the year before, the first year of the Iowa contests, somewhat over one-thi d failed to follow this practice. In Indiana, where soybeans have been grown over a longer period of time, 33 of 51 growers inoculated in 1942.

Richland was the most popular variety in both Indiana and Iowa in 1943. Previously, Mukden had been the leading Iowa variety, but many turned to the earlier maturing Richland after the disastrous September freezes of 1942. Manchu was second Iowa choice in 1941, but only two grew this variety in 1942, and one in 1943. Illini and Dun-

J. L. Trisler, Fairmont, won the Illinois 1943 yield championship with a 10-acre field of Chiefs averaging 39.36 bushels per acre, using his own certified seed.

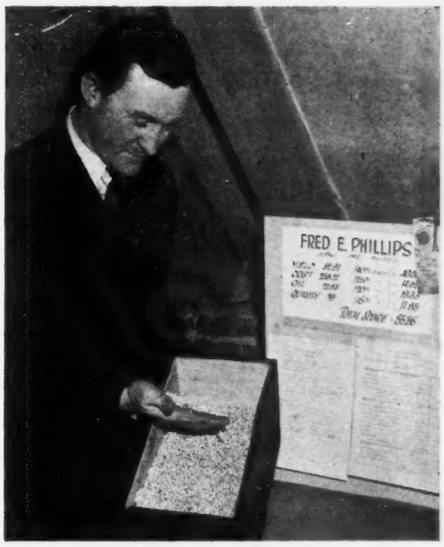
field are grown in the southern part of the state.

The Richland was used by approximately one-half the Indiana contestants in 1942, primarily because of its adaptation to fertile soils. It stands well, does not grow coarse, and matures early. Its yielding ability is on a par with later varieties in central Indiana on fertile soils. Most contestants were in central Indiana. In the southern half of the state varieties of more satisfactory adaptation to longer growing seasons were used.

Chief and Illini have been the most popular among Illinois contestants.

The Indiana yield champion, Lawrence Allen of Madison County, hung up the top yield for the three states for 1943, with a 42.9 bushel average. J. L. Trisler, Fairmont, Illinois champ, averaged 39.36, Bert Kinsinger, Grundy Center, Iowa winner, 38.72.

Average yield obtained by all Indiana contestants was approximately the same as for 1942. However, unfavorable conditions in Iowa and Illinois prevented contestants from reaching their 1942 average. The 1943 Iowa average was 28.7 bushels compared to 32.6 in 1942; in Illinois the average was 34.45 compared to 39.7. However, the average yield for Illinois prior to 1943 has been consistently above that of its sister states. The Illinois state winners led the field in both 1941 and 1942: Fred E. Phillips of Arthur, with 52.9 in 1942, and Paul Wess-



Fred E. Phillips of Arthur, Ill., hung up the all time record in yield contests in 1942 with a 10-acre field of Chiefs averaging 52.9 bushels. Nobody equalled his record during the past year. Fred's son is shown in the picture.

becker of Mt. Pulaski, with 50.7 in 1941.

Late May planting is the common practice in Indiana with a trend toward later planting in river bottoms, to facilitate weed control before planting, and a trend toward early May planting in corn borer infested areas in order to get some of the planting completed before time for delayed corn planting for corn borer control.

Last year most Iowa soybeans were planted between May 21 and 28. But in 1942, when early conditions were more favorable, almost a third planted before May 15. There seems to have been no correlation between planting date and yield in Iowa the past few years.

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POSTWAR USE FOR SOYBEAN OIL

To the Editor:

I should like to recite my own personal experience in the use of soybean oil and offer it for possible consideration as one of the uses of soybeans after the war.

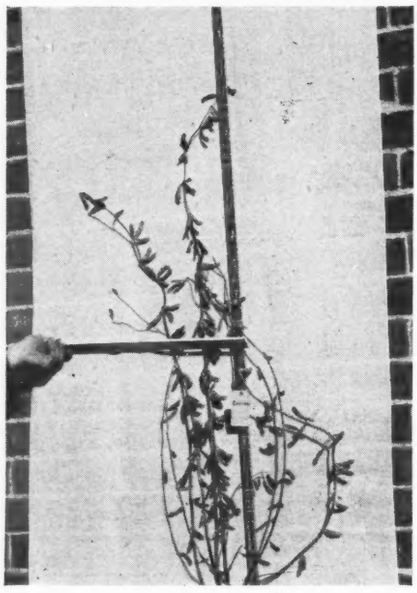
For a number of years I had been troubled with chronic constipation and while temporary relief was afforded by the use of ordinary cathartics, I found no permanent cure could be made by their use and that it was likely to become habit forming. I then tried the various mineral oils which I found to be much more satisfactory than the cathartics but which were objectionable because of leakage.

In June, 1942, I visited the U. S. Regional Soybean Laboratory at Urbana, Ill., in company with Mr. Morse and brought up the question of using soybean oil for constipation, found that some use had been made of it, but the results were not generally known. I then obtained a quart of soybean oil and for the past year have been taking a tablespoonful each night before retiring. Let me say here and now that the decision to try soybean oil was a happy one for I am no longer troubled with constipation, there is no leakage and I have been able to reduce the dosage to thrice weekly instead of daily. In addition I have recommended it to several of my friends who were suffering with constipation and a check showed they had the same results that I did.

E. C. SCOTT, Beltsville, Md.

Lincoln

A New Variety High in Yield and Oil Content



A single plant of Lincoln which measured 51 inches in height.

By C. R. WEBER

Article and photos are from Farm Science Reporter

A NEW soybean variety that has "showed its heels" in yielding ability to every other bean with which it has been compared in Iowa for the last five years will be grown by a few Iowa farmers in 1944 and it should be in the hands of many who want to give it a try in 1945 and 1946. It promises to be one more vital aid to our farmers in their "food battle" of this war period.

The new variety, Lincoln, has outyielded Richland, Mukden, B. H. (Black Hilum) Manchu, Dunfield and Illini in northern, central and southern Iowa tests that range from three to five years. The Lincoln has been ahead of every other variety in yield in all of these tests every year.

But that doesn't mean that it may be *just the variety you want.* For instance, it doesn't stand up nearly as well as Richland, not quite as well as Mukden, but it is better than Dunfield and Illini. In none of the Iowa station tests has it ever lodged badly enough to cause excessive loss in harvesting. Then, too, Lincoln is too late, our tests show, to be safely grown in the northern third of Iowa. We are therefore recommending that it be grown only in the counties from Woodbury, Webster, Black Hawk and Dubuque south and not in any counties north of these.

We do not need to lean entirely on the Iowa station tests to measure the yielding ability of this new soybean variety, for it has had extensive tests in Ohio, Indiana, Illinois, Missouri and Nebraska also. As an average of 61 replicated trials in those five states and Iowa during the five years of 1938 to 1942, Lincoln has outyielded Illini and Dunfield by an average of 6.1 bushels to the acre, or 22 percent. It has averaged a day earlier than Illini, has lodged less than either Dunfield or Illini and has had superior seed quality. It has been superior to Dunfield in percentage of protein, percentage of oil and drying quality of the oil. Dunfield has been considered the best variety in quality of oil.

And so — for the southern two-thirds of Iowa, as well as many areas of our surrounding states — Lincoln offers to step up yield of beans to the acre and, because of its higher oil content, it should be a real boon in this war period when fats and oils are so badly needed.

In order to insure the widest distribution and the most rapid increase of high quality seed of this new bean variety, local units of the different farm organizations in the southern two-thirds of Iowa were asked to recommend men in the different counties best qualified from the standpoint of previous experience, equipment and weed free soil, to receive the 1943 seed. The whole effort has been to place the seed in such a way as to insure its most rapid increase and ready availability to the largest number of farmers for planting in 1945. Arrangements have already been made for the distribution of the entire 1943 seed supply. Many should be able to obtain seed locally for planting in 1945 and almost anyone who wants it for the 1946 crop.

NOT A "HYBRID"

Lincoln is not a "hybrid" bean — it came from a natural variety cross between a white flowered Mandarin and Manchu. The original hybrid between these two varieties was grown by C. M. Woodworth at the Illinois Agricultural Experiment Station in 1935. From individual plant selections made and tested by L. F. Williams of the United States Regional Soybean Laboratory, in short progeny rows, this new variety of Lincoln originated. It was first tested in yield trials in 1938.

In search for superior adapted varieties of soybeans approximately 3000 plant introductions from the Orient have been tested cooperatively in Iowa by the United States Regional Soybean Laboratory and the Iowa Agricultural Experiment Station. Varieties now recommended, such as Mukden, Richland, Illini, Dunfield, Black Hilum Manchu and so forth, are the result of single plant selections from plant introductions into the United States. However, not all of these varieties were selected in Iowa. Nor was the Lincoln variety selected in Iowa. The greatest emphasis in soybean breeding work in Iowa is on the production of superior varieties for commercial utilization.

Soybeans, like oats, are naturally self-pollinated. To artificially make a hybrid, it is therefore necessary to apply pollen by hand from one variety to the newly opened flower of another variety. This cross pollination must be performed at a critical stage, and even with skilled workers only a few crossed seeds can be produced from many hours work.

The Iowa Station and other experiment stations are doing some hybridization in cooperation with the Regional Soybean Laboratory. For example, we are trying to "hook up" through hybridization the early maturity and ability which Richland has to stand up and not lodge along with the yielding ability and the good oil qualities of Lincoln.

Hybridization in soybeans is quite different from that in corn. With corn the plant

• *Account of a new outstanding soybean variety that will be grown on Mid-*
• *west farms in the near future. Mr. Weber is assistant agronomist of the USDA stationed at Iowa State College.*

This picture was taken just before maturity.

Lincoln plants at the combine stage.

The above picture shows the technique in hybridizing soybeans. Magnifying glasses and good light are essential. The tiny flower must be carefully opened and the pollen of another variety dusted on the seed producing parts. Lincoln is not a hybrid, but a pure line selection from a hybrid population.

breeder takes plants which normally are cross-pollinated and sees that they are self-pollinated — producing inbreds — finally getting them into purified lines. These inbred lines are then crossed to get the "push" which the crossing of inbreds brings.

Obviously when you have to open the tiny flower of the soybean at just the right stage (using good light and magnifying glasses in order to see what you are doing) and dust on it carefully the pollen from another variety in order to get one soybean pod, we can never hope to get much hybrid soybean seed. Sometimes these pollinations do not "take," and in that case you get no seed for the work. If the pollination is successful, you may get from one to three seeds — average one. The specific purpose of hybridization in soybeans is to bring together and re-combine the characters of two varieties so that in later generations you can select the one or ones that have the particular characters you want.

It was through a cross of varieties that Lincoln originated, but the cross happened to be one of the few natural crosses — not made by man.

Lincoln has a yellow seed with a black hilum (scar), white flowers, tawny (brown) pubescence (the hairiness of stems and leaves) and resembles Manchu in general habit and growth.

Lincoln is not the "last word" in soybeans and we hope that in the future other still better ones will come. In the meantime, until Lincoln seed becomes available for those in the areas to which it is adapted, what should we do to step up production? Iowa stands second in the United States in the number of bushels of soybeans produced, but third (Illinois and Ohio are ahead) in yield per acre. Iowa soybean yields can be expected to rise steadily as farmers gain experience with this crop, which is well adapted to Iowa soil and climate.

SUBSIDIES — AN ILLINOIS VIEW

E. J. Working in *Illinois Farm Economics:*

In the opinion of the writer, inflation could have been prevented and could still be held in check without resort to subsidies. With sound methods of Government finance and credit control, inflation could have been prevented and prices could have been controlled with only a relatively small amount of direct price control.

Congress and administration officials in charge of our fiscal and banking policies did not choose to prevent inflation through fiscal and banking control. Instead they adopted a policy of inflating credit, but of restricting increases in prices and wages through direct controls. Under such a system, economic strains are bound to develop both because of mistakes in setting price ceilings and because of changing conditions. If a given ceiling price is set too high or becomes too high relative to others, it is almost impossible under the pressures of credit inflation to lower that ceiling price; hence, it may be necessary to raise the other prices.

INFLATION SPIRAL

The spiraling of "controlled" prices may be illustrated by what has happened to some agricultural products. A little over a year ago, farm groups demanded that something be done to stop the seasonal decline of hog prices lest farmers sell their hogs at too light weights. A support price of $13.25 was then provided and this was later raised to $13.75. Meanwhile, both the CCC and OPA were holding down corn prices. But it soon developed that those who wanted to buy corn for feeding dairy cattle couldn't get enough corn. Many farmers could make more money by feeding corn to hogs than by selling it. We have recently had an increase in the corn price ceiling. Before this there were demands for higher prices of dairy products, and the increase of corn price ceilings caused even more pressure. *Now, soybean growers say that soybean prices must be raised or corn will be more profitable and there won't be enough soybeans grown.* Next, we shall probably have demands for higher prices of soybean oil and meal, vegetable shortenings and so forth. With higher prices for things farmers buy, including corn, vegetable shortenings, and oil meals, parity will rise and some price ceilings on farm products will have to be raised correspondingly in order to meet the requirements of the law. The process is an endless upward spiral unless something is done to break it.

One possibility of stopping the spiral is to ease the inflationary pressure by putting a halt to credit expansion. Another is to use subsidies in place of price increases and thereby stop the rise in the cost of living and of parity prices.

In the final analysis, it may not make very much difference in the extent of inflation whether subsidies are continued or not. It is quite likely, of course, that doing away with direct subsidies would soon result in a marked increase in prices and the cost of living. However, it seems likely that the administrative officials of the government are very anxious to avoid the disorganizing effect of a rapid price inflation, and it is altogether possible that if they are denied the use of subsidies in connection with direct price controls, they may adopt a method of credit control, which, in the long run, will serve the same purpose.

Illinois Processors Meet

By DR. G. L. JORDAN

Extension Editor, College of Agriculture
University of Illinois

● *In order to establish contact with the soybean research work being carried on at the state colleges, Illinois and Iowa processors held conferences at Urbana and Ames similar to the annual conferences being held at Ohio State University. The meetings are reported on this and following pages, and some of the papers given are published.*

SIXTY-FIVE persons representing all but one processor of soybeans in Illinois conferred with staff members at the University of Illinois, Urbana, February 24. Staff members discussed the agronomic and economic problems of production, including the response of varieties to soil and other environmental characteristics, the creation of new varieties, the place of soybeans in the rotation, response to fertilizers and the cost of production of soybeans. "Problems of the Soybean Processor" was the subject of a paper presented by D. J. Bunnell, Vice-President, Central Soya Company, Incorporated. Lamar Kishlar, Chairman of the Soybean Nutritional Research Council emphasized the necessity for careful attention to production for highest quality of oil and protein if the soybean is to capture and hold its rightful place in the food field in his paper "The Soybean in the Postwar World."

Dr. W. L. Burlison, head of the Department of Agronomy at the University, was chairman of the conference and pointed out that back of the recent phenomenal growth in soybean production and use are years of research pertaining to their production, handling and utilization. The University of Illinois Agricultural Experiment Station began investigations of varieties in 1896. Since that time every department of the station has done research on soybeans. New improved varieties have been developed, cultural practices studied, costs of production and marketing and storage problems analyzed, the nutritive value of meal compared to other protein concentrates, the use of soya flour, soybean oil, edible soybeans and soybean sprouts as human food and many other phases of this important crop studied. Dr. Burlison pointed out that it was impossible to even touch upon some of these phases in a one-day session and that other phases might well be developed at some future conference.

Edward J. Dies, president of the National Soybean Processors Association, opened the conference by emphasizing the influence that wars have upon the future economy, including agriculture. Mr. Dies suggested that more such meetings would be desirable.

At the Alhambra Field in southern Illinois varieties such as Chief, Patoka, Macoupin and Mt. Carmel have given good results, according to R. F. Fuelleman of the college staff. Boone and Morse have also done well in that area. In central and south central Illinois farmers should continue to have a major portion of their crop planted to Dunfield, Illini and Chief. Mt. Carmel variety also did well at Urbana. Dunfield and Illini are midseason varieties; Chief and Mt. Carmel are midseason to late. The Richland and Wisconsin Manchu were most uniform with respect to sustained yields in northern Illinois, according to Fuelleman. Average yields of some outstanding varieties at the three stations are tabulated below.

Station	Richland	Mandell	Illini	Dunfield	Chief	Mt. Carmel	Sciota
Mt. Morris	27.7	25.3	23.6	23.3	—	—	—
Urbana	27.8	31.7	31.6	32.4	31.5	33.0	30.7
Alhambra	—	—	25.2	23.9	26.9	29.0	21.9

Dr. C. M. Woodworth explained how new improved varieties are obtained. He listed the characteristics desired and some of the sources of these characteristics in parent plants as follows:

Characteristics	Source of Desirable Germ Plasm
Shattering	Chief, Illini
Lodging	Richland, Mandell
Japanese beetle	Chief, Illini, Gibson
Oil content	Lincoln, Dunfield
Maturity	Early: Earlyana, Richland Late: Chief, Patoka

With this information at hand, parents of crosses can be chosen in a scientific manner. Dr. Woodworth emphasized that selection of plants is a very powerful tool in the hands of the breeder. He pointed out that Chief and Viking were developed from a cross between Illini and a strain of Manchu; Lincoln, from a natural cross between Mandarin and Manchu; Gibson, from a natural cross between Dunfield and Midwest. Varieties Illini, Richland, Dunfield, Mukden, and Patoka originated from other varieties or introductions as pure line selections.

During 1943 the U. S. Regional Soybean Laboratory inaugurated soybean pathological research as an integral part of the laboratory. Dr. W. B. Allington of the laboratory reported the investigations being carried on, particularly with bacterial leaf spots. One appears to be a relatively new disease that has great destructive potentialities. It has not been named. Another disease that may cause considerable damage is caused by viruses. It is tentatively called "bud blight." A start has been made to combat soybean diseases but an expansion of the work is urgently needed according to Dr. Allington.

Dr. Appleman discussed the place of soybeans in the crop rotation. He pointed out the primary importance of inoculation, particularly on fields where beans are being grown for the first time, relative erosion losses with different cultural practices and the extent to which soybeans added to or removed plant food elements from the soil. Both Dr. Appleman and Mr. Lang emphasized the importance of the available supply of potash. In southern Illinois and even in some soils of central and northern Illinois, the supply of available potash is becoming limited. The potash problem is accentuated when the crop is harvested for hay but even when harvested for seed, large quantities of potash are removed from the soil.

On the basis of detailed cost accounts kept by farmers in Champaign and Piatt counties in cooperation with the University of Illinois, the net cost per bushel of growing soybeans has declined considerably in relation to the price received during the past 12 years. In reporting these results Professor R. H. Wilcox of the University staff pointed out that there have been wide differences in costs per bushel between individual farmers but less difference in acre costs. The greatest differences in costs were due to differences in yields. Part of the differences in yields was due to differences in soils, part to management and cultural

(Continued on page 18)

William E. Riegel, farmer, and member of University of Illinois Agricultural Experiment Station advisory committee, Tolono, raises the question of the place of soybeans in the farm economy during the Soybean Processors Conference at the University of Illinois. Seated, at extreme right, Edward J. Dies, President of the National Soybean Processors Association. Standing, left of Mr. Riegel, Dr. W. L. Burlison, Head department of agronomy, University of Illinois College of Agriculture, chairman of the conference.

Our Common Interests

● *These two significant papers were presented at the Soybean Processors' Conference at the University of Illinois February 24. Mr. Dies, president of the National Soybean Processors Association, opened the conference. Dr. Kishlar is chairman of the Soybean Nutritional Research Council.*

By LAMAR KISHLAR

WAR has given the soybean its big opportunity. With the entrance of the United States into World War II both our fats and our protein situations were transformed from a condition of plenty to one of scarcity.

It was most fortunate that the soybean had secured a firm position in the domestic economy before war clouds appeared and that its production had grown from a mere 5 million bushels in 1924 to 107 million bushels in 1941. Within a few days after Pearl Harbor the farmers of America were asked to increase their soybean acreage by a large margin over 1941. In only 20 years the soybean has multiplied itself nearly 40 times — an astonishing record. But it does not indicate what the soybean can do in the postwar world.

Soy oil is very versatile. It has many properties which make it desirable as food oil. At the same time it has many qualities which recommend it for technical uses. Chemists have a test for evaluating the drying properties of an oil; it is called the iodine number of the oil. The higher the iodine number of the oil the better it is for technical purposes where quick-drying properties are desired. On the other hand for edible uses an oil with low iodine value is prized, because low iodine number indicates better keeping qualities.

In the early days of the soybean's domestication large quantities of cottonseed oil and animal fats were available at low prices. Partly because of the price situation then existing and partly because of the romantic attraction of creating new industrial uses, most of the creative thinking was devoted to developing soybeans with high iodine number oil, and greater progress was made alone this line.

In 1933, just ten years ago, less than 1 million pounds of soy oil were used for all edible purposes while 22 times that amount were used for soap, paint, linoleum, and in similar mechanical products. Today, the figures are reversed and nearly 1-1/5 billion pounds are used for food while less than one-sixtieth that amount finds its way into mechanical industry.

GREATEST OPPORTUNITY

Thus the soybean finds its greatest opportunity in the postwar world in the food field. If the soybean is to retain its share of the edible oil market, soybean varieties yielding light-colored, bland-flavored oils with low iodine numbers are desired.

Within a few short years, the oil technologist has created new man-made products from vegetable oils which, on their own merits, have crowded many animal fats formerly used into the soap kettle.

The modern oil chemist has a whole bag of tricks for decolorizing dark oils and for removing unpleasant odors and flavors. But these modern refining methods are relatively costly, require special handling of the oil, and reduce the manufacturing capacity. The excessive treatment which many dark oils require removes some of nature's protective substances from the oil so that the resulting product may have a poorer keeping quality.

In general there are three types of damaged soybeans. The first is due to an early frost or excessive drought just at the time the beans are maturing. The soy oil made from these frost-damaged or drought-arrested seeds is frequently bright green in color and causes great trouble and expense to the refiner.

The second common problem is caused by hard, early freezes coupled with the shortage of men, which prevents a normal harvest and results in many beans remaining in the field for part or all of the winter.

The third type of damage is caused by improper storage either on the farm, in the country elevator, or in the processors' storage bins. Beans which have a high moisture content will heat when stored in a tightly closed bin.

The soybean grower can no longer be satisfied with bushels per acre alone. The soybean crusher must broaden his horizon to think beyond goals measured in terms of tons of oil meal and pounds of oil. The soybean technologist of the postwar world must think as much about color, odor, flavor, and keeping quality of this oil as he does about high yields and low refining losses. Moreover, the soybean technologist must think as much about proper cooking and extraction to give better flavor, better uniformity, and better growth in oil meal as he does about percent nutrients printed on the tag. It is final results — not printing on the label — which will count in the postwar world.

By EDWARD J. DIES

Out of all great wars come new ideas, new inventions, and new products. The composite mind, when restless and combative, and under the drive of necessity, seems to break barriers and set new forces in motion.

And so it is that during a major conflict the economic panorama moves rapidly. Then in peace years that follow there is a shifting about, with some new industries rising and others drifting into stagnation.

Whether the whole of agriculture is in for major changes, for good or for bad, I would not presume to discuss before you men of scholarly attainments in the field of agriculture. But it is doubtful that agriculture will be an exception in the period of reshuffle.

And in this future the soybean must continue to stand out sharp and clear. It has become a 400 million dollar a year industry. It has earned its place on the stage of agriculture. That place must not be relinquished. But to retain it, the struggle may be greater than that experienced in the past decade.

SOME QUESTIONS

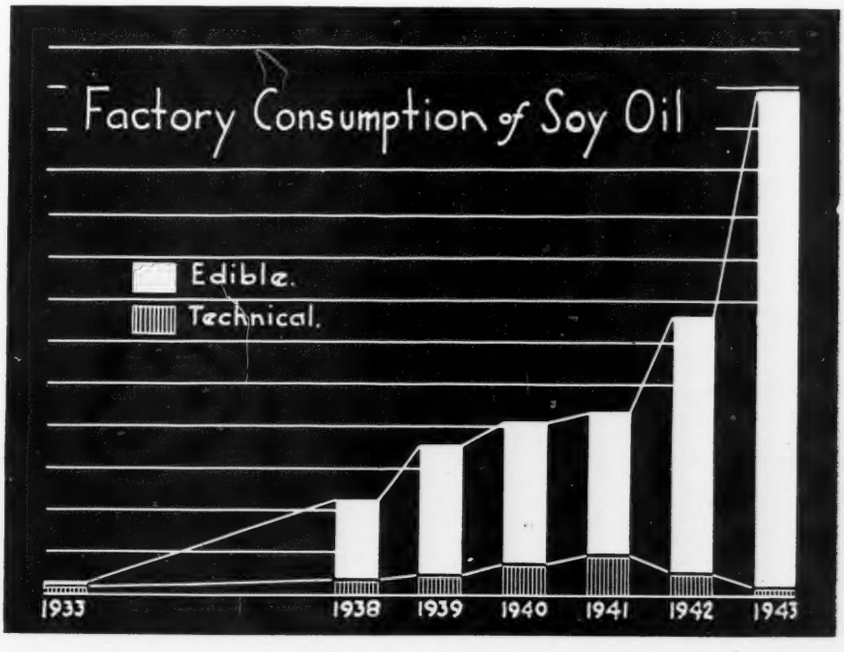
There are of course many things processors and growers would like to know in fashioning post-war plans. They would like to know, for instance, whether tariffs will be lowered or abolished, as some global-minded men now predict. If so, will surplus soybeans and their products move easily and naturally into export channels?

Will renewed imports of vegetable oils lessen the demand for soy oil?

Will competing proteins, in an era of fewer animal numbers, depress the price of meal and, accordingly, the price of soybeans to a point of unprofitability to the grower? Or, through educational efforts by experiment stations and others, will feeders utilize the percentage of proteins actually needed in the animal and poultry ration and thus help justify continued bumper crops?

And what of plastics and chemurgy? Can this feed and food crop actually be grown profitably in large volume for industrial

(Continued on page 12)



Iowa Processors

• HOLD FORTH AT AMES

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Dr. H. D. Hughes, head of the Farm Crops Department of the college, was chairman of the conference. Papers presented by members of the college staff covered studies of the agronomic and economic phases and work with the solvent extraction process. Speakers included Dr. Hughes; I. J. Johnson, crop breeding; C. R. Weber, assistant agronomist, United States Department of Agriculture; A. J. Englehorn, soils; W. H. Pierre, professor of agronomy; L. K. Arnold, chemical engineering department; E. L. Barger, agricultural engineering research; and C. E. Malone, farm management specialist.

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PRESENT POSITION OF SOYBEANS AND A

Look at the Future

By C. E. MALONE

Farm Management Specialist
Agricultural Extension Service
Ames, Iowa

From speech delivered at Iowa Processor Conference

IN RECENT years, factory consumption of soybean oil has gone primarily for food purposes. Cooking compounds account for about 52 percent; margarine for 20 percent; other edible uses about 8 percent; soap, 4 percent; drying oils, 6 percent; and miscellaneous uses, including manufacturing loss, 8 percent. During the past four years there have been no important changes in the uses of soybean oil for commercial purposes.

Some have felt that the use of soybean oil for drying oils, as in paint, would be an important and growing market. The record to date does not so indicate, since in the 10-year period, 1931 to 1940, 2.7 percent of all the drying oils was soybean oil and in 1942 the percentage was 2.8. While this market may grow in the future, it does not appear to hold promise as a major outlet for the oil.

Vegetable oil has been one of the important products of world trade. In spite of growing trade restrictions prior to the war, world exports of oil and oil seeds were expanding. Major exports were in tropical oils, soybeans from Manchuria, linseed from the Argentine and elsewhere, and cottonseed from several areas.

In the post-war period, we and other nations hope to adopt a free trade policy, so that exports and imports are allowed to move about the world in the interests of greater prosperity and a more stable peace. It may very well be that this will have some considerable degree of effect on the soybean oil industry. In the immediate pre-war period, the price of soybean oil per pound was near the low end of the list of the major fats and oils.

Prices during this period when there were relatively free markets show soybean oil eighth in price among the principal fats and oils. Only edible tallow averaged lower in price. It may be that this price is affected by the fact that it is the newer oil in the list and is the one that has been rapidly expanding in production.

Turning to soybean meal, which, as was pointed out earlier, accounted for 58 percent of the total value of the product at the finish of the processing period, we find a corresponding expansion in production and

use, the same as with oil. Up until 1942, practically all of the soybean meal was used for animal feed. More recently, considerable amounts are being diverted direct to human uses, largely for lend-lease and relief purposes, although we have an allocation of some 2 pounds per capita, for civilian use in the United States. The development of methods and the expansion of processing in removing the bitter taste from soybean meal has made it a product usable in the human diet. However, the use of the meal for stock feed still forms the principal market.

Looking ahead to the post-war demand, it seems clear that soybean meal must continue to play a dominant role as a source of livestock protein. One of the things that has grown out of the wartime livestock production program is a much wider use of protein feeds to balance livestock rations. It seems likely that this will continue in the post-war period and that the tonnage of high protein feed in demand by farmers will be considerably higher in proportion to the grain fed than in the pre-war period. It does appear, however, that the demand for high protein feed is quite elastic in comparison with feed grain and livestock product prices. This suggests that to maintain strong demand for soybean meal that the price of the finished protein will have to be in keeping with its value to the farmer as a supplement to his grain feed.

The use of soybean meal, or other forms, for human food is too new to warrant making any predictions as to the extent of its future use. In this connection a paragraph from the 1943 annual report of the director of the Food Distribution Administration is of interest. "At 30 cents a pound for meat, the cost of meat protein figures out at around $2.00 a pound. When milk retails at 15 cents a quart, the cost of milk protein also is $2.00 a pound. When soya meal retails at 35 cents a pound the cost of the soya protein is only 70 cents a pound."

PSE AS PLASTICS

The possibility of using soybean products in plastics is also of interest. However, developments to date in this field do not indicate that the tonnage of soybeans that will find use in plastics in the immediate post-war period will be large. It is possible, of course, that this use may greatly expand but trade reports to date are not especially assuring for any real large volume of use of this kind.

In summary then, we can say that soybeans appear to be on the domestic scene as a major crop in the future, even though some shrinkage in acreage will no doubt take place at the close of the war. Soybean oil must enter the highly competitive vegetable oil field, which includes both domestic and imported oils. Thus far it has had some price disadvantage in this field. Continued strong demand for the soybean meal seems more certain than for the oil. While demand for meal is not likely to remain at the high level of 1943 and 1944, in the post-war period, the number of livestock in this country will likely remain large and the need for protein to balance the livestock rations will be strong. The question of making the soybean meal available to the livestock producer at a cost that will encourage him to use a large amount for balancing his rations will be of importance. When the present extremely strong demand for protein feeds is over, processors will need to look more closely to handling and selling methods that will keep these costs down in the interests of larger volume.

THE IOWA FARMER AND HIS

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● Mr. Roach, who is vice president of the American Soybean Association, and president of J. Roach's Sons, Inc., Plainfield, Iowa, tells about some of the problems of the grower. From his speech before the Iowa processors' conference.

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TWENTY-FIVE years ago a new crop was introduced to the farmers of the Corn Belt. This, shall we say new baby, had been conceived years before when the United States Department of Agriculture sent Dr. W. J. Morse to China to investigate and send to the United States the results of his discoveries, together with identified samples of soybeans.

For a number of years farmers paid little attention to this new arrival. Some farmers planted soybeans for hay when they were short of roughage, but, for the most part, soybeans were a special crop and new skills had to be acquired to grow them. Long debates were held in the country elevators, and on cracker boxes in the village stores, as to whether it was better to broadcast, or drill, or plant in rows so the crop could be intertilled. Other debates were held regarding the rate of seeding, how hard soybeans were on the ground, the best way to inoculate, how to harvest and all the other details that are necessary for the farmer to know in order to successfully grow and harvest a crop. Agricultural colleges, through their experiment stations, started to find the answers to these questions, yet some of them are still unanswered.

All this took place during the time we now look back to as the "Roaring Twenties." Most farmers were making fair money and interest was not as great as the advocates of the "wonder" crop wished. During this time the agricultural press described soybeans under such captions as "What's New in Agriculture."

The baby became an adolescent during the drouth years and depression of the thirties. Twelve cent corn and $2.50 hogs made 65 cent beans look like a gold mine. Lack of sufficient forage, due to the drouth and the killing of legume seedings, forced farmers to plant soybeans for hay. The Triple A programs encouraged this youth and industry started to afford a market for the grain.

A few feeders became acquainted with the meal as a source of protein for their animals, and the National Farm Chemurgic Council, with Henry Ford as the spokesman, told the American public about this youth that was becoming a man and prophesied great things for the future.

PEARL HARBOR

Then came Pearl Harbor and the loss of our source of vegetable oils from the Orient. This soybean youth, over night, became a man and the nation looked to it to do a man's job, even as your lad and mine were expected to do their duty. The growers responded and in 1943 we produced the largest acreage of soybeans in our history. We are being asked to do even more in 1944.

The American Soybean Association, with a directorate composed of a soybean growers, met in December 1943 at Chicago and passed a resolution recommending that the support price of soybeans be fixed at approximately two and one-half times the price of corn, if the goals of the War Food Administration were to be reached. This action was taken after conference with the American Society of Farm Managers, an organization having membership in the United States, Canada and Mexico.

It is hard to convince the farmer that he is doing more for the war effort by producing 1500 pounds of beans per acre than by producing 3920 pounds of corn or 1600 pounds of oats both of which are used on the farm for feed. This is particularly true when corn will be far more profitable, and oats acreage has been cut to the minimum, from the standpoint of labor utilization and feed requirements. Within the past few days the addition of 10 cents to the announced support price making it now $2.04 per bushel, comes nearer this goal.

At a meeting of the Iowa Association of Farm Managers held here on the campus at Ames two weeks ago, the unanimous opinion was expressed that Iowa probably would not have a greater acreage of soybeans planted this year than in 1943. The reasons given were the low support price, the lack of harvesting facilities in those areas that had not previously grown many beans, and the need for corn to be used as feed to support our livestock population.

MAJORITY ATTAINED

The soybean youth has now attained his majority and is a full grown man. The farmers have nurtured him and are pleased with his characteristics. The same tillage tools, planter, cultivator, combine, elevator, etc., care for this crop as are required to care for other corn belt crops. Beans can be planted after the corn is in the ground, cultivated while the cultivator is still attached to the tractor and harvested before the corn has to be picked. Therefore, from the standpoint of machinery and labor utilization soybeans fit well into the farm program.

There has been resentment this winter because there was not enough soybean meal to meet the demand, and many soybeans are being ground on the farms and fed in that manner to livestock as a source of protein. In the future farmers will store more beans on the farms so as to be in a better trading position for soybean meal. The farmer who sold his beans at harvest time last fall has been short of soybean meal this winter, while the neighbor who held his beans has been able to trade them for some meal. Much name calling and bitter words have been exchanged this last fall and winter over the protein shortage. It is not the purpose of this paper to fix any blame. However, we all know that such controversies are poor ways of building good public relations.

What about the future of the soybean? When conditions again become normal, price will be the deciding factor. The farmer will ask himself "Which crop will bring the greatest return?" That is the way it always has been and will be again. If beans are profitable to grow they will be

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TWENTY-FIVE years ago a new crop was introduced to the farmers of the Corn Belt. This, shall we say new baby, had been conceived years before when the United States Department of Agriculture sent Dr. W. J. Morse to China to investigate and send to the United States the results of his discoveries, together with identified samples of soybeans.

For a number of years farmers paid little attention to this new arrival. Some farmers planted soybeans for hay when they were short of roughage, but, for the most part, soybeans were a special crop and new skills had to be acquired to grow them. Long debates were held in the country elevators, and on cracker boxes in the village stores, as to whether it was better to broadcast, or drill, or plant in rows so the crop could be intertilled. Other debates were held regarding the rate of seeding, how hard soybeans were on the ground, the best way to inoculate, how to harvest and all the other details that are necessary for the farmer to know in order to successfully grow and harvest a crop. Agricultural colleges, through their experiment stations, started to find the answers to these questions, yet some of them are still unanswered.

All this took place during the time we now look back to as the "Roaring Twenties." Most farmers were making fair money and interest was not as great as the advocates of the "wonder" crop wished. During this time the agricultural press described soybeans under such captions as "What's New in Agriculture."

The baby became an adolescent during the drouth years and depression of the thirties. Twelve cent corn and $2.50 hogs made 65 cent beans look like a gold mine. Lack of sufficient forage, due to the drouth and the killing of legume seedings, forced farmers to plant soybeans for hay. The Triple A programs encouraged this youth and industry started to afford a market for the grain.

A few feeders became acquainted with the meal as a source of protein for their animals, and the National Farm Chemurgic Council, with Henry Ford as the spokesman, told the American public about this youth that was becoming a man and prophesied great things for the future.

PEARL HARBOR

Then came Pearl Harbor and the loss of our source of vegetable oils from the Orient. This soybean youth, over night, became a man and the nation looked to it to do a man's job, even as your lad and mine were expected to do their duty. The growers responded and in 1943 we produced the largest acreage of soybeans in our history. We are being asked to do even more in 1944.

The American Soybean Association, with a directorate composed of a soybean growers, met in December 1943 at Chicago and passed a resolution recommending that the support price of soybeans be fixed at approximately two and one-half times the price of corn, if the goals of the War Food Administration were to be reached. This action was taken after conference with the American Society of Farm Managers, an organization having membership in the United States, Canada and Mexico.

It is hard to convince the farmer that he is doing more for the war effort by producing 1500 pounds of beans per acre than by producing 3920 pounds of corn or 1600 pounds of oats both of which are used on the farm for feed. This is particularly true when corn will be far more profitable, and oats acreage has been cut to the minimum, from the standpoint of labor utilization and feed requirements. Within the past few days the addition of 10 cents to the announced support price making it now $2.04 per bushel, comes nearer this goal.

At a meeting of the Iowa Association of Farm Managers held here on the campus at Ames two weeks ago, the unanimous opinion was expressed that Iowa probably would not have a greater acreage of soybeans planted this year than in 1943. The reasons given were the low support price, the lack of harvesting facilities in those areas that had not previously grown many beans, and the need for corn to be used as feed to support our livestock population.

MAJORITY ATTAINED

The soybean youth has now attained his majority and is a full grown man. The farmers have nurtured him and are pleased with his characteristics. The same tillage tools, planter, cultivator, combine, elevator, etc., care for this crop as are required to care for other corn belt crops. Beans can be planted after the corn is in the ground, cultivated while the cultivator is still attached to the tractor and harvested before the corn has to be picked. Therefore, from the standpoint of machinery and labor utilization soybeans fit well into the farm program.

There has been resentment this winter because there was not enough soybean meal to meet the demand, and many soybeans are being ground on the farms and fed in that manner to livestock as a source of protein. In the future farmers will store more beans on the farms so as to be in a better trading position for soybean meal. The farmer who sold his beans at harvest time last fall has been short of soybean meal this winter, while the neighbor who held his beans has been able to trade them for some meal. Much name calling and bitter words have been exchanged this last fall and winter over the protein shortage. It is not the purpose of this paper to fix any blame. However, we all know that such controversies are poor ways of building good public relations.

What about the future of the soybean? When conditions again become normal, price will be the deciding factor. The farmer will ask himself "Which crop will bring the greatest return?" That is the way it always has been and will be again. If beans are profitable to grow they will be

grown, and if more profitable than other crops the acreage will increase. If the American public again looks to the islands of the South Seas for their source of vegetable oils, and soybean meal is so cheap that it may be used for fertilizer and no other uses are found for the crop, the acreage will decline. Farmers are not growing soybeans because they are enthusiastic about the crop. They are growing beans because they have been profitable to grow. They fit well into the rotation and enable the farmer to better utilize his labor.

The future of the crop depends on how good a job the processors do in maintaining their present markets and in establishing new markets. The same man who grows soybeans also feeds cattle, milks cows and fattens hogs so there should be no fight between the interests that process the crops grown by the same man on the same farm. By cooperation and planning, between the growers and the processors, between dairy middlemen and vegetable oil manufacturers, between soybean and animal protein processors, the future of the soybean crop is assured. However, fighting between the groups processing the various products raised on the same farm and sold by the same man, does not deceive the farmer, and only serves to confuse the consumer and bring down the heavy hand of government regulation upon the belligerants. The grower should be treated fairly as to weights, grade and price, should be told the truth about the ultimate use of the soybean, both meal and oil. The grower is not only interested in the beans he grows but wants to know the end use of his crop. More publicity about these matters by the soybean processors will not only be splendid public relations, but will enable our soybean crop to develop into the robust maturity that it deserves.

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OUR COMMON INTERESTS

(Continued from page 9)

purposes? The factual evidence at hand is not yet conclusive.

And what of the soya food outlook? Under urgent government pressure the soy flour industry performed a near miracle of rapid, vast expansion of capacity, and improvement of quality. The industry thus guaranteed a national supply of food protein, come drouth or flood or excess Allied demand. Will the government relax and forget, or will it see that this capacity is used for better protein nutrition of the future? Will it retreat before competitive pressure groups? Or will Food and Drug Administration and the Bureau of Animal Industry adjust regulations in recognition of the high protein food value of soya foods? Thus Americans in the lower brackets could obtain the low-cost protein supply long denied them, with no ill effect upon other standard proteins. This, as leaders of the growers contend, is vitally important to the over-all future of soy.

There, in brief, we have some of the questions — the imponderables — to be faced when victory comes. And wars have a way of ending abruptly and confounding the experts.

Of one thing we can be sure. A new spirit of cooperation in research has developed between industry and government and the great universities of the land. This philosophy of unified effort for the common good is inspiring and bodes well for the future. But here let me make plain that this spirit is not entirely new at Illinois. The University of Illinois . . . in the very cradle of large-scale soy development . . . has a long, proud record of co-operation which has earned the admiration and respect alike of farmer and business man.

There remains only for me to extend the deep gratitude of all processors for what you men have done in the past, and for what you contemplate doing in the future. And, incidentally, to pay my personal respects to two great scientists of soy who have helped to influence my thinking and minimize my blunders — Dr. W. L. Burlison and Professor J. C. Hackleman.

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EDIBLE SOYBEANS GROWN IN CALIF.

George Berkon, Jr., shows that edible soybeans grow very well in the sandy soil near Arlington, Calif. The above photo shows him holding a plant that grew to six feet in height.

Mr. Berkon, who is trying to develop a market for the green vegetable soybeans for canning and freezing and for home use, says he has been successful with Green Tokyo, Mammoth Yellow, and the Giant Green.

He has his own ideas on fertilizers. In the fall of 1942 on a wornout alfalfa field that had failed to yield him a crop of beans in 1942 he disked under several inches of the following: soybean pulp, from which the milk had been extracted, red skins from peanuts, and scorched wheat bran and grains such as grits of wheat, rye, soy, etc. He reports a good crop.

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RATE AND DATE OF PLANTING

The middle of May usually is the best time to plant soybeans in Iowa and the best rate of planting is about 1 bushel an acre.

This is the conclusion reached at the Iowa Station from 3 years of experiments which included five different rates and five different dates of planting. The rates varied from 0.6 bushel to 2.2 bushels an acre, planted in rows 32 inches apart.

The dates of planting for the 3 years (1939, 1940 and 1941) were May 1, May 12, May 23, June 3 and June 14. — *Farm Science Reporter.*

SOYBEANS . . . and People

Garden Soys

By H. W. HOCHBAUM
Extension Service, WFA
and Chairman, Victory Garden Committee
Washington, D. C.

ONE of our aims in the Victory garden program is to encourage more people to plant the kinds of vegetables that are of greatest value in protecting health, and which at the same time are fairly easy to grow. Now some of the vegetable varieties of soybeans fill this need admirably, and everything should be done to encourage greater plantings by home gardeners. Soybeans are easily grown, they yield well, and they are rich in food value. The fresh green soybeans are very rich in vitamin A, especially the varieties that are deepest green in color. They are also a very good source of thiamin (vitamin B_1), and a good source of riboflavin (vitamin G). Moreover, people learn to like soybeans as a fresh vegetable.

BEAR TILL NOVEMBER

Some varieties come into bearing in mid-August, and others later, so that by a selection of proper varieties, we can have them in bearing here until November. Especially valuable they are in areas where the gardens so often dry out in summer, for soybeans stand dry soil pretty well and yield something green when some of the garden is on strike. Therefore, soybeans deserve every consideration, for one of the problems of the Victory gardener is to plan and cultivate the garden so that it produces to the fullest in late summer.

— Courtesy University of Tennessee

Soys may yield from two to two and one-half times as much as common beans. A deep-green protein rich food that adds variety to any table.

Mr. Werner Meyer on the Federal staff of the extension service had a fine Victory garden in Bethesda, Md., this year, and said his garden was the finer and more enjoyable because of the excellent yield he obtained of green soya. His family enjoyed them fresh from the garden, and through the winter they will enjoy the canned soybeans put up during the summer.

The extension service of the University of Tennessee found that three kinds of soybeans averaged 1 1/3 cups of shelled beans to three feet of row. This yield, however, has been exceeded by some gardeners who have good soil and favorable growing conditions. In fact, Dr. William J. Morse, whose name will be linked permanently with soybeans not only in the Department of Agriculture but throughout the United States, has told me that some of the vegetable varieties of soybeans yield from two to two and one-half times as much as our common lima beans.

VARIETIES

Mr. Morse recommends the following varieties for the eastern and central states: Nokkaido, Jogun, Imperial, and Kanro. Giant Green and Tastee are two early varieties recommended to enable enthusiasts to lengthen the season of production. For the southern states, Seminold, Edsoy, Nanda and Rokusun are recommended. For those who have room and want to grow small dry beans for sprouts, the well known Bansei is suggested.

Soybeans should be grown in rows 24-30 inches apart. Therefore, it may not be practical to grow them in the small Victory gardens, say gardens less than 30 x 30 feet. Too many Victory gardeners planted corn, potatoes, cucumbers, and other space-taking crops in 1943. Such crops do not yield enough in small gardens, and in planting them the Victory gardener sacrifices space that might be given to other vegetables that yield more commensurately.

PLANTING TIME

Soybeans should be planted at corn planting time when the ground is warm and all danger from late frost is past. The seeds should be planted about one inch deep and three inches apart in the row. At this rate, one pound of seed will plant about 400 feet of row. The seeds preferably should be inoculated with a soybean culture before planting.

The crop is cultivated like corn or any other garden vegetables. The beans are ready for use when the pods turn yellow green. This is from 100 to 130 days after planting.

So far as pests go, soybeans have one advantage and one disadvantage. The Mexican bean beetle which is such a pest on our common snap beans does not bother soybeans if other beans are nearby. But oh! how the rabbits love them. Some eastern Victory gardeners plant soybeans to lure the rabbits away from the snap beans.

Shall we plant soybeans in the Victory garden? Well, if we want a delightful fresh green vegetable in late summer and fall, one that is easily grown and yields well, we will by all means plant soybeans — that is, provided we have enough space and a fairly long growing season. And on farms and in the larger Victory gardens in town and suburbs, we should also increase our plantings to have soys to can, to dry, and for sprouts.

By T. JACKSON SMITH

Assistant Agronomist
University of Arizona

SEARCH FOR SUITABLE VARIETIES IN ARIZONA

WORK with soybeans has been conducted for the past several years at the Arizona Agricultural Experiment Station in the hope of finding or developing varieties suitable for southwestern irrigated areas. The only consistent grower in Arizona has been the manager of one of the larger dairies, who has used soybeans as a soiling crop. Because of difficulties in harvesting the mature beans, soybeans can be grown more easily for forage than as a grain crop. But even the growing of soybeans for forage has not developed satisfactorily due somewhat to the lack of seed of adapted varieties.

The better types have consistently produced 3½ to 4½ tons of forage and 35 to 40 bushels of beans per acre when grown under irrigation at the lower elevations in the State. However, under the semiarid atmospheric conditions in this region, most strains and varieties that have been tested shatter completely as soon as ripe. Relative humidities are very low and soybeans soon dry down to 6 to 10 percent moisture, even while standing in the field. A few of the soybean varieties now being grown in the Southeast will produce good yields here but are not suitable for grain production because of shattering.

Shattering is by no means our only problem but it has received considerable attention. In the past three years both the plant breeding and agronomy departments have developed strains that are relatively non-shattering — providing harvest is not delayed too long. But even the most shatter-resistant strains will lose their beans if left in the field for more than a few weeks after maturity. These new strains are very promising although yields have not equalled our highest producing varieties. This work is continuing with the idea of developing higher yielding strains.

Several other problems have been ironed out. One of the first was to find strains or varieties that would produce good quality seed under our hot, dry summer climate. Most varieties from the more humid regions fail to set seed here, or else the beans that are produced are of poor quality. Many of the vegetable varieties are exceptions as they produce excellent yields even in midsummer although the quality of the mature beans is generally poor. Hundreds of different strains and varieties have been tested. We now have types that produce seed of excellent quality so far as color, size, uniformity, viability and oil content are concerned. However, a high percentage (25-30 percent) of hard seeds has been produced with some varieties in certain instances. No explanations have been found. Many soybean strains have also been eliminated because they will not stand the high salt content in some of our soils. Soybeans seem to be more susceptible to high salt content than to high alkalinity.

Investigations thus far indicate the best planting period to be between May 15 and June 15. This allows the plants to flower during the period of summer rains and produces a much better yield of higher quality beans. Planting too early in summer will prevent proper flower fertilization, and will also reduce the quality of the beans that are produced. Soybeans grow well either on a flat seed bed or on ridges. The best yields have been obtained by planting in rows. Seeding rates should be about twice that normally used in the more humid regions.

IRRIGATION TESTS

Irrigation tests were first started in 1943. Yields varied for the same variety on the same soil from 1000 to 2000 pounds per acre. No irrigation recommendations can be made from the limited data available. However, too much as well as too limited a water supply will apparently reduce yields under the conditions of this preliminary experiment.

We have not been able to get consistent nodulation of soybeans even with inoculation. Lack of nodulation is apparently not confined to certain soils but is associated with several factors. Some that are receiving attention include temperature, soil moisture, organic matter, sunshine as affecting C-N ratio, previous cropping history, alkalinity, and high salt content.

Soybeans will make excellent growth on most soils in this area, and to date we have observed no differences in plant growth or seed yields between fields that were nodulated and those that were not nodulated.

D. C. Aepli, superintendent of the Salt River Valley Experiment Farm at Mesa, Arizona, examines the Armredo variety about Sept. 20. This variety was developed at the University of Arizona, yielded 30 bushels per acre.

Where nodulation has occurred, it has generally been excellent. Nodulation has also been found in fields in which soybeans have apparently not been grown before, even though the seed was not inoculated.

We are not yet ready to recommend unlimited production of soybeans in Arizona. However, by using improved strains, we feel that the better farmers and ranchers should be able to grow soybeans profitably. A limited amount of seed is being released for planting in 1944.

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Best results from the use of soybeans to provide hog pasture have been found to be when they are planted in connection with corn where both crops are to be hogged down. Soybeans alone do not make a very satisfactory forage crop for hogs.

Some Illinois Experience With Inoculation

Russell S. Davis, Clayton, Ill.: There are still a lot of questions about inoculation that I don't have the answers for. I have thought at times there was a difference in varieties in their ability to make use of inoculation. But later we find seemingly easy varieties to inoculate bearing no nodules whatever even when growing in soils previously producing crops with abundant nodules.

We had an unusual experience in 1943:

FIELD A — One of our highest in fertility level; has grown inoculated soybeans in the rotation for 25 years; plowed early April 1943; extremely wet season run ground together; water grass and smart weeds ten inches high were disked down June 20th (three diskings needed); weather favored us, we got a clean seedbed; planted forty inch rows; no cultures used; crop clean; good deep green color; *but no nodules.* Every little variation in fertility level in the field was reflected in the height of the crop. Yield 15 bu. per acre. *Grew beans 1942.*

FIELD B — Joins Field A; similar in every way except the general fertility level is about five bushels per acre less; plowed wet June 21st; seedbed quite rough; forty inch rows; no cultures; planted June 23rd; clean crop; same variety as Field A; *plenty of nodules;* plants uniform height (not showing the little variations in fertility level); yield 27 bushels per acre. Grew corn 1942, except for an acre and a half in the middle of the field where we had an isolation multiplier plot of Lincoln soybeans in 1942. The crop on this acre and a half was very like that on Field A. No nodules, uneven height,

no check was made on its yield, but it was visibly poorer.

The $64 question is — What made this difference in nodulation, *and yield?* We often hear reports of beans following beans doing better than following corn, but this is one exception. The cultures people tell us that is just one more illustration of why we should use cultures every year. How I wish we might have had a cultures check strip in Field A.

We had used cultures on all but these two fields. Shortage of help, and the rush to get to cultivating forbade getting it done on these last plantings.

J. E. Johnson, president of American Soybean Association, Champaign, Ill.: With an apparent letting down in the soybean acreage on the part of those states supplying the large percentage of the Nation's soybeans, the efficiency and capacity essential for producing the much needed food as a vital weapon of war should be given the most careful consideration.

Inoculation, speaking for soybeans, has long been known as one of the very important items in the efficient production of soybeans. Granting that tests would indicate little benefits on fields where soybeans had been grown for several years the cost of inoculating soybeans is so small that growers can not afford to take chances with even these fields and surely not where soybeans are being planted for the first, second or third time. This practice could be likened to the carrying of insurance on your property, while we do not expect the fire we take this as a safety measure.

Through the Digest we wish to encourage each and every grower to think in the terms of *highest efficiency* in soybean production for the 1944 and all succeeding crops, making use of proper inoculation as one of the factors for obtaining the highest possible yields.

Harold L. Garwood, Frank S. Garwood & Sons, Stonington, Ill.: Up until three or four years ago, it was our belief that soybeans need not be inoculated more often than every second or third soybean crop, on land that did not show acidity. However, experimentation on our own farm within the past two or three years has proved to us, that we get slight increases in yield by inoculating our soybean seed each year. This increase in yield has been more than enough to compensate for additional inoculation and handling costs.

On more acid soils and soils of lower fertility levels, inoculation has seemed to increase yields to a greater extent than it has on non-acid soils of higher fertility levels.

Nebraska

Martin V. H. Prinz, Omar, Inc., Omaha: Less than 40 years ago a few enterprising farmers tried to raise this new crop (soybeans), generally with discouraging results. Meanwhile scientists had discovered the secret of soybean cultivation. It consists in a certain type of bacteria, growing on the roots of the plant, which converts nitrogen from the air into soluble nitrogen compounds that can be assimilated by the growing plant. These bacteria are different from those growing on the roots of other leguminous plants. In the Far East, where soybeans have been grown for thousands of years, they are present in the soil. In the West they were not, and their absence was the reason for poor growth, low yields and an inferior composition of the seeds. The only remedy was to breed these bacteria in laboratories and to distribute the cultures among farmers, who had to be taught how to inoculate either the seeds or the soil, in order to obtain satisfactory crops. This was done in the United States on a large and ever increasing scale.

J. E. Johnson, president of the American Soybean Association, is one of Illinois' leading farm managers. All soybeans grown on the more than 60 farms under his direction are inoculated.

The Illinois Conference

(Continued from page 8)

practices. Man labor and horse labor have been greatly reduced by mechanization. During 1943 corn production in this area was more profitable than soybean production. Using average yields for the area, the price of soybeans would have to be 2.2 times the price of corn to make soybeans as profitable as corn according to Wilcox.

Mr. Bunnell pointed out the problems faced by growers of soybeans in the early years before there was a processing industry, recalling the names of early varieties now replaced and the prices of nine to eleven dollars per bushel charged for seed in the spring of 1920. Present day problems of processors were also discussed — problems caused by wartime controls and rapid expansion to take care of urgent needs. But the more normal problems of peacetime received most consideration by Mr. Dunnell. Among these were the physical characteristics of the crop, especially as influenced by the weather. The crop of 1942 was cited as an example. Thousands of acres went into winter unharvested; when finally harvested field damage ranged from 25 to 80 percent. Storage was a serious problem but the strain on processing equipment was extremely heavy. The 1943 crop had a low oil yield which affects processors' operations. Oil content should be recognized in the grade and more orderly marketing of soybeans would be an advantage both to the farmer and the processor, according to Mr. Bunnell.

The work of the United States Regional Soybean Laboratory was explained by Jackson L. Cartter, who is in charge of the Urbana laboratories on the university campus. Some of the principal activities carried on at Urbana relate to agronomic features, testing and selection of varieties and strains with respect to oil and protein content, the effect of environmental influences upon the yield and composition of beans, the effect of the date and rate of planting, the date of harvest, the fertility level of the soil and fertilizer applications on yield and composition. The Laboratory also studies soybean diseases and the development of new varieties of beans. All of this work is in cooperation with Agricultural Experiment Stations in the soybean growing regions. One of the most important results of this cooperative work is the new variety, Lincoln. This is a strain from a natural cross made by the Illinois Agricultural Experiment Station in 1934. It is outstanding with respect to yield and oil content of the seed. Seedstocks have been increased during the past season enough to plant a considerable acreage in 1944. Mr. Cartter said that the Laboratory seeks to provide for more rapid development of improved varieties for industrial utilization.

PIONEERS

In presenting a Review and Preview of Soybeans in Illinois, J. C. Hackleman of the University of Illinois Agronomy Department paid tribute to the pioneers in the field and largely attributed the progress of the soybean in Illinois to the following six factors:

1. Introduction or creation of new varieties.
2. Variety demonstrations in more than three-fourths of the counties of the state.
3. Adaptation of the combine to soybean harvesting.
4. Development of a commercial market for the surplus beans.
5. The price guarantee of the American Milling Company, Funk Brothers Seed Company and GLF in 1928.
6. The Northern Regional Research Laboratory.

Looking ahead to the postwar period, Hackleman stressed the necessity of helping the farmer avoid serious erosion and soil fertility depletion. He expects an increased interest in vegetable types of soybeans in Illinois; some shift back to more oats as a nurse crop for clover; a smaller acreage of soybeans than in 1943 but a larger acreage of corn unless the corn borer forces farmers to shift from corn to soybeans.

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AN EXTRA BUSHEL

"If every acre of soybeans in the state could be made to yield one extra bushel of beans in 1944, the total yield for Illinois would be increased by approximately four million bushels," R. F. Fuelleman, assistant professor of crop production, University of Illinois College of Agriculture, points out.

"If each bushel contains 12 pounds of oil, the increased oil production alone is potentially 48 million pounds. This, in turn, has large potentialities in the manufacture of feed, food and munitions. Hence, the importance of using the variety best adapted to the section in which it is grown and of growing the crop on soil capable of yielding the largest quantity of beans per unit of area."

No. 2 in a series of informative articles on the margarine industry, second largest user of soybean oil.

Good nutrition for the nation

Mother Nature must sometimes cast an envious eye at the makers of margarine—the nutritious, low-cost spread for America's bread. For here is a food product of our American farms that man's own inventive genius has moulded into a great force for good in our daily diet.

Margarine is 80% edible fat—preponderately vegetable oil—made highly palatable through scientific, sanitary methods of manufacture. Spread on bread—or used as a seasoning for hot cooked dishes—it helps provide basic energy fuel daily for millions of Americans.

Vitamin A—a Great Contribution!

And among the many important improvements made in margarine, its fortification with Vitamin A stands out as one of the truly great contributions that have been made to good nutrition. Practically all margarine sold through food stores in America today has important Vitamin A added —to the extent of 9,000 USP units per pound.

Through outstanding nutritional betterment, and constant improvements in flavor and quality, margarine has won friends by the millions—now has a per capita consumption of over four pounds per year. It is holding these friends—adding millions of new friends each year—because people like margarine . . . like the way it tastes . . . like the nutritional goodness of it . . . and know it is economical to buy!

You members of the American Soybean Association are furnishing increasing quantities of a highly refined vegetable oil that is one of margarine's principal ingredients. With your association, we share the hopes of a brighter future for margarine when peace returns to the world.

THE NATIONAL ASSOCIATION OF MARGARINE MANUFACTURERS

Munsey Building . . . Washington 4, D. C.

★ PUBLICATIONS ★

REVIEW OF THE LITERATURE ON THE NUTRITIVE VALUE OF SOYBEANS, by Richard H. Barnes and Jean E. Maack. 63 pages, published by the Hormel Institute of the University of Minnesota.

Cites 224 other publications. The authors say that this work contains considerable repetition of earlier work, but that it is an attempt to give a complete analysis of the subject matter on the nutritive value of soybeans as it exists today.

The authors make a conservative report on the value of soybean protein. Quoting them, "The results show that a well-prepared soy flour or oil meal is approximately the same as casein, but inferior to milk, meat products, and eggs. . . . The nutritive value of a standard commercially prepared soy flour would appear to be intermediate between the poor quality cereal proteins and the high quality meat proteins.

"Other combinations that have been investigated show a marked supplementation between soybean and cereals and point out the value of combining soybean flour in the diet with such food products as bread and macaroni."

Concerning the oil for human and animal feeding: "Soybean oil takes its place among the high quality vegetable oils in the human dietary. In animal feeding the value of the oil is more doubtful. This is largely due to the fact that the ingestion of soybean oil by swine results in the formation of soft pork. . . . While the inclusion of relatively large amounts of soybean oil in the feed of feeder calves and steers does not cause specific changes in the color, firmness or iodine value of the carcass fat, it is economically unsound to fortify cattle rations with an oil that holds such an important place in the human dietary."

Of the minerals, "calcium and phosphorus are found to be relatively abundant in soybeans. . . . Few natural foods exceed soybeans in iron content and most of it is available to the animal. Thus, soybeans are of outstanding value as a source of iron for hemoglobin formation."

Concerning vitamins, the authors find the thiamin choline content high, and pantothenic acid, pyridoxine and vitamins E and K present in significant amounts. Soybeans are found to be low in ascorbic acid, vitamin A and riboflavin. Niacin is present in fair amounts.

SOYBEAN PROJECTS OF THE STATE AGRICULTURAL EXPERIMENT STATIONS, 1944, by Henry M. Steece (U. S. Dept. Agr., Agr. Res. Admin., Off. Expt. Stas., 1944, pp. 23). — Entries in this list of 400 currently active research projects, concerned with the production, handling, and utilization of soybeans, including edible soybeans and soybean products, give the project title, station department, and cooperating agencies.

This is a list of the research projects concerned with soybeans, including edible soybeans and soybean products, currently active at the several state agricultural experiment stations. It was compiled in response to requests from the state experiment stations, the U. S. Department of Agriculture, and other agencies for such information as an aid in their work on various problems connected with the production, handling, and utilization of soybeans.

This list supersedes a similar publication entitled Soybean Projects of the State Agricultural Experiment Stations, 1937 (May 20, 1937). Most of the projects listed as active in the earlier publication have been completed and replaced by new researches. These deal with numerous problems constantly arising in the soybean industry and reflect the broader scope and greater complexity of the general problem. Enormous expansion in the United States soybean acreage, with recent shift in center of production from the Southeastern States to the Corn Belt, has brought forth problems inherent in the peculiar sensitiveness of soybeans to variations of soil and climate. In addition are those problems concerned with newer production methods, changes in cropping systems, insects and diseases, harvesting, and storage.

Stations cooperating with the U. S. Regional Soybean Laboratory (Urbana, Ill.) in conducting coordinated adaptation (nursery) tests with groups of varieties and selections include the Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Virginia, and Wisconsin stations. At several stations these tests are carried on as distinct projects, while at other stations the tests proceed as phases of other projects.

WASHINGTON DIGEST

By PORTER M. HEDGE
Washington Correspondent for The Soybean Digest

Support Price Hike

As *The Digest* indicated in its last issue, War Food Administration this month increased its support price on the 1944 crop of soybeans from $1.94 to $2.04 a bushel for green and yellow soybeans grading No. 2 or better with 14 percent moisture.

Premiums for lower moisture content will raise the support price on top quality (11 percent) soybeans to $2.10 a bushel. The support will be 20 cents a bushel lower ($1.84) for brown, black and mixed soybeans.

The increase in support price was dictated not so much by farmer demands for a price hike but by the realization on the part of War Food Administration that $1.94 was too little incentive for farmers to produce up to the greatly increased 1944 soybean goal.

WFA's new announcement said "Non-recourse loans will be made available to farmers at the support prices. The loans will be available until Jan. 31, 1945, and will mature on April 30, 1945, or earlier upon demand.

"The War Food Administration will also offer to purchase soybeans at the support prices through terminal and other elevators and to enter into price supporting contracts with processors under which processors will agree to pay not less than the support prices for soybeans purchased by them, and the Administration will agree to make soybeans available for processing at prices based upon applicable ceilings."

Protein Supplies

Supplies of protein oil meals, both for batch-mixing and for sale to farmers as ingredients, can be expected to grow somewhat more plentiful during the spring and summer months even though the protein meal situation will continue tight throughout the year.

This is the feeling in high quarters of the War Food Administration because of two reasons:

1. The quarterly quota restriction on feed manufacturers, which limits the amount of oil meal a mixer can use in any one quarter to 30 percent of his annual quota, is causing a little more meal to be offered.

2. The Feed and Livestock branch of War Food Administration under Walter C. Berger, expects to continue monthly set-asides of oil seed meal throughout the year, instead of cutting them off as the demand eases this spring as once planned.

Berger says the quota restriction on feed manufacturers "already is beginning to make the protein meal situation seem a little easier in most sections of the country."

WFA's purpose in continuing the oil meal set-asides is to keep the distribution machinery running, keep state feed industry advisory committees functioning, and to have a program already set up and operating when demand for meal picks up in the fall.

Berger told the *Digest* there was no indication at this time that the monthly set-aside would have to be increased beyond the present 20 percent, but he indicated that summer demand for raw protein ingredients probably would keep the set-aside percentage pretty close to that figure.

A 20 percent set-aside of April oil seed meal production is expected to be announced by WFA some time this month. The March allocation of oil meal to states amounted to 132,000 tons, compared with a February allocation of 140,000 tons.

Berger asserted that Government-directed protein meal distribution in most sections of the country "has proven that we've gotten meal to people who were unable to get it before the program went into effect.

"It has also shown that some of the people who were yelling for meal the loudest — some large and some small mixers, and some feed dealers — were not eligible for increased allocations, based on the 1942-'43 average volume used in making feeds or sold as straight ingredients."

Those 1944 Bean Goals

Off the record, top officials of War Food Administration are beginning to doubt that 1944 soybean plantings will reach the national goal of 13,654,000 acres, despite the increase in price support.

A rough survey currently indicates plantings may fall 2 to 2½ million acres short of the goal. An official estimate of 1944 plantings will be available March 20 when the Bureau of Agricultural Economics issues its intentions-to-plant report.

Meanwhile, WFA does not plan to lower its soybean goal figures, says the need for soybeans is just as great or greater than last year, and will drive ahead through AAA committeemen to obtain at least as many acres as were harvested a year ago and go over that figure if possible.

Competition for acreage from feed grains, supplies of which are expected to be tighter this year than last, is cited here as the chief reason for an expected below-the-goal acreage, though the original "bargain basement" $1.94 a bushel support price also is said to have had some effect.

Competition from oats is expected to equal, or even exceed, that from corn, according to reports reaching Washington. This is because of improved, higher-yielding oats varieties, a need for early feed, and the fact that oats fit well into crop rotation systems.

Reports of State AAA committeemen in Washington recently for a conference indicates these prospects for soybean plantings in some of the major bean producing states:

Iowa — will fall short of its 2,890,000-acre goal, but increase acreage about 3 percent over a year ago.

Illinois — will just about equal its 1943 plantings of 3,444,000 acres. Illinois goal is 4 million acres.

Indiana — is expected to exceed its goal of 1,600,000 acres.

Missouri — probably will go over its goal.

Ohio — indicated acreage up about 15 percent; is expected to exceed its goal.

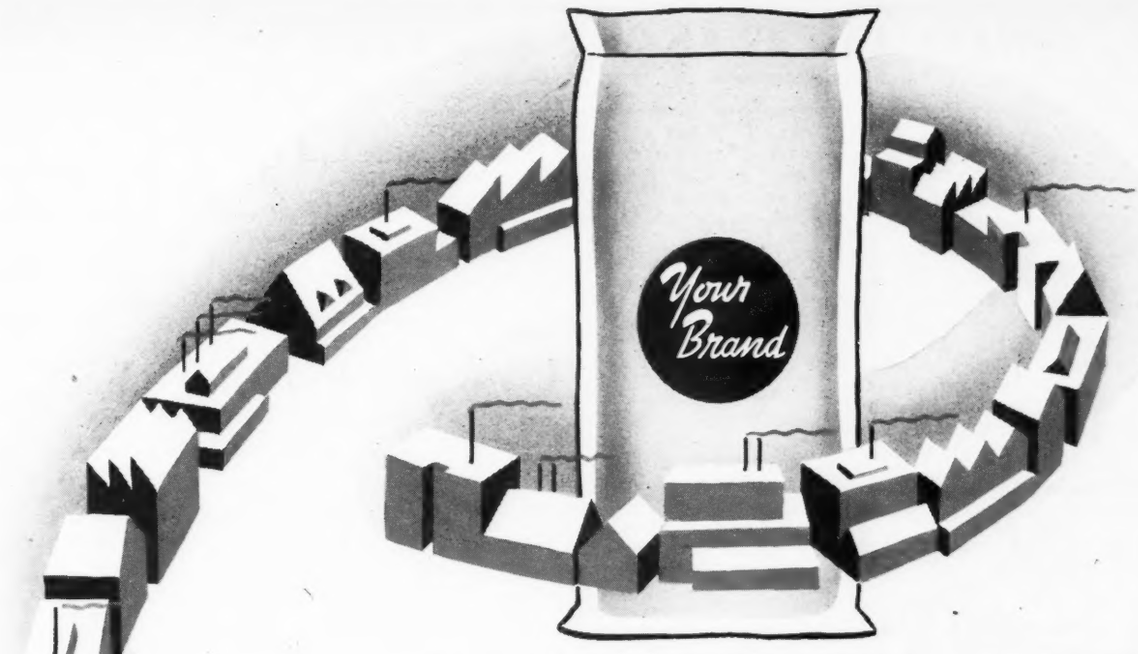
The Agricultural Adjustment Agency, responsible for obtaining 1944 crop production, will launch an intensive spring drive to obtain more soybean acreage in Illinois, Iowa, and other states west of the Mississippi where increases appear possible.

— Courtesy The Feed Bag

Meet Walter Berger and His Family

Walter C. Berger left the Des Moines Oats Products Company in charge of his wife — "the boss," he says — and came to Washington last December to head up War Food Administration's Feed and Livestock branch. Here you see him with his family in their Des Moines, Iowa, home. Left to right, they are Mrs. Berger, Margaret Kay, Brook, Bruce, and Walter.

Berger was born and reared on an Iowa farm in Jones county, was captain of the state championship high school football team in 1920, is a graduate of Iowa State College, has worked for some of the largest firms in the food and feed manufacturing and distributing trades, and was regarded as spokesman for the small feed mixers and dealers on the National Feed Industry Council before being drafted to go in to Washington.



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FROM THE INDUSTRY

Twenty-five field service men on the Seedburo-Steinlite staff attended a meeting at the Midland Hotel, Chicago, February 10 and 11, 1944, sponsored by L. M. Smith, President, and P. W. Burrows, General Manager of Seedburo Equipment Company. Most of the time was devoted to technical discussions related to operating and servicing the Steinlite Electronic Moisture Tester for grain, dehydrated foods and related products. Some attention was devoted to the new Mangelsdorf Seed Germinator and other grain and seed laboratory apparatus sponsored by Seedburo Equipment Company. The essential theme of the meeting was: "How to be of Greater Service to Steinlite Users." Attending the meeting from the Steinlite Laboratories, Inc., Atchison, Kansas, were F. A. Mangelsdorf and Eugene Moore. W. I. Brockson of Gebhardt and Brockson Advertising Agency, Chicago, discussed the Seedburo publicity program and how it is serving Steinlite users.

The Neff & Fry Company, manufacturers and builders of both concrete stave and monolithic storage bins for the past 30 years, for the storage of all free flowing bulk materials such as grain, sand, gravel, coal, iron ore, magnesium, lime, cement, etc., announces the appointment of D. H. Herbster as vice-president and general manager. Mr. Herbster has been associated with The Neff and Fry Company for the past six years during which time the growth of the company has been outstanding. Previous to his association with The Neff and Fry Company he had broad experience in the material handling and conveying field.

The War Food Administration announces it soon will release about 4,000 cases, approximately 120,000 pounds, of dry pea and soya soup powder to civilian consumers. Stocks being released represent a portion of Government reserves which have been held for war requirements. The action follows the Office of Distribution's policy of releasing food reserves to civilian consumers as soon as it is determined that such stocks are not needed for essential war requirements.

University of Illinois home economists experimented with 20 samples of soy flour from 14 different companies scattered over the country on one project to determine the amount of soybean flour that can be used in various baking products. They found that they could use: 100 percent in Brownies, 50 percent in cookies, 33 percent in spice cake (also in plain cake but a different type product is obtained), 25 percent in muffins and biscuits, 15 to 20 percent in bread and 16 percent in pastry.

Most Iowa farmers agree with recent results found at the state experiment station, indicating that soybeans are not so hard on the land as corn and take less labor to produce. This is shown by a recent poll of Iowa farmers by *Wallaces' Farmer and Iowa Homestead*. Sixty-three percent of farmers polled said that soybeans are easier on land than corn, while 37 percent disagreed. Sixty-seven percent were of the opinion that beans require less labor to produce than corn.

M. Clifford Townsend, former governor of Indiana, is now associated with the Central Soya Co., Inc., and its subsidiary, the McMillen Feed Mills, Fort Wayne, Ind. He will act as consultant on legislative problems and public relations.

Peanut oil meal is not as efficient as either soybean oil meal or cottonseed oil meal as a protein supplement for fattening steers, says the Tennessee Agricultural Experiment Station.

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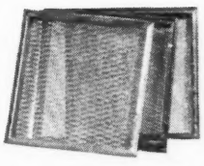

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No. 101 BOERNER SEED SAMPLER OR MIXER — Reduces size of seed sample containing foreign substances of different specific gravity or size — produces sample specimen representation of the original, Height 15⅜", Dia. 6". Price $75.00.

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Seed Directory

A charge of $1 has been made for listing in the March, April and May issues. Listings in the April and May issues can be made to subscribers for 75c. Quantity for sale and variety are included.

IOWA

Castana — Fred W. Hawthorn, 1,000 bu. blue tag, certified Richland, germination 92 percent. No crop or weed seeds.

Hudson — Strayer Seed Farms, 2,500 bu. Richland, 250 bu. Kingwa, 250 bu. Bansei, 500 bu. Mukden.

Sac City — F. H. Wilson, 400 bu. certified Richland.

Sac City — Williams Milling Co., 4,000 bu. certified Richland.

Sac City — Hobart Hill, 250 bu. certified Richland, germination 95 pct.

New Hartford — Moore & Good, 2,000 bu. certified Richland, 5,000 bu. uncertified Richland, 2,000 bu. uncertified Habaro.

Marcus — R. E. Simonsen, 900 bu. uncertified Richland, from certified seed.

Sanborn — O. J. Bieser, 100 bu. certified Richland, 50 bu. uncertified Mukden, 350 bu. uncertified Richland.

Whiting — Knud Westergaard, 3,000 bu. certified Richland.

Boone — Roscoe Marsden, 250 bu. certified Richland, blue tag, 93 pct. germination.

Hampton — Ralph R. Hurd & Fred Blau, 700 bu. certified Richland.

Sac City — M. R. Clark and W. C. Otto, 300 bu. certified Richland, 98 pct. germination.

INDIANA

Remington — Chester B. Biddle, 1,000 bu. certified Dunfield, 1,500 bu. certified Richland.

Pence — D. L. Martin, 2,800 bu. certified Richland, 700 bu. certified Dunfield, 250 bu. certified Chief.

Windfall — Mitchell Farms, 2,000 bu. certified Richland, purity 999, germination 90.

Noblesville — Conner Prairie Farm, Rt. 5, 2,000 bu. certified Richland, purity 99, germination 92 and 95.

Peru — Richard E. Edwards, P. O. Box 315, 1,300 bu. certified Richland.

Indianapolis 44 — Walter R. Askren, Rt. 10, Box 188, 500 bu. certified Richland.

Leesburg — Ralph Brubaker, 200 bu. certified Earlyana, 300 bu. uncertified Richland.

Windfall — Byron Legg, 1,000 bu. certified Richland, 93 pct. germination, 1/10 pct. mixture.

Ft. Wayne 8 — O. L. Bryant & Son, Rt. 4, 500 bu. certified Richland, 800 bu. certified Dunfield.

Indianapolis 44 — Phillip W. Irwin, Rt. 19, Box 676, 2,000 bu. certified Richland.

Evansville — Henry L. Hahn, Rt. 2, 2,000 bu. certified Gibson.

Greenfield — Raymond E. Roney, 15 bu. uncertified Funk Delicious, 99 pct. varietal purity; 100 bu. certified Patoka, 99.6 pct. varietal purity; 200 bu. certified Richland, 99.95 pct. varietal purity.

Muncie — O. C. Russell & Son, Rt. 1, 500 bu. certified Richland, 200 bu. certified Dunfield, 200 bu. certified Kingwa (black hay bean), all high in varietal purity.

Crawfordsville — Walter J. Harper Seed Co., Rt. 1, 200 bu. certified Richland, 200 bu. certified Mandell.

Seymour — T. Volney Carter, Rt. 2, 400 bu. certified Chief.

Swayzee — John W. Whybrew, Rt. 1, 800 bu. certified Richland.

Milford — Lee R. Cory, Rt. 1, 700 bu. certified Mandell.

Alexandria — Eugene Gwaltney, Rt. 1, 400 bu. certified Richland.

Knightstown — Ray Cannell, Hackleman Farms, 1,200 bu. certified Chief, 500 bu. uncertified Richland.

Princeton — Princeton Farms, 700 bu. certified Patoka, 700 bu. certified Gibson, 600 bu. uncertified Macoupin.

Kouts — Wm. H. Olsen, Rt. 1, 1,000 bu. uncertified Richland.

Hartford City — D. M. Langdon Sons, Rt. 1, 800 bu. certified Richland.

Williamsport — Floyd Martin, 600 bu. certified Richland, 400 bu. certified Dunfield.

Lapel — Omar J. Sears & Sons, Rt. 1, 700 bu. certified Richland.

ILLINOIS

Champaign — Seeber Bros., Rt. 3, 6,000 bu. certified Chief; 1,000 bu. uncertified Richland; 1,500 bu. uncertified Mt. Carmel.

Normal — H. L. Stiegelmeier, 706 Normal Ave., 1,200 bu. certified Richland.

Atwood — John H. Livengood, Sr., 600 bu. certified Dunfield, 100 bu. certified Patoka, 300 bu. certified Richland.

Mason City — Ainsworth Seed Co., 1,000 bu. certified Chief, 500 bu. certified Richland, 2,500 bu. uncertified Illini.

Cantrall — C. E. Canterbury, 500 bu. Illini, 2,500 bu. certified Chief.

Ladd — Martin Manning, 250 bu. certified Richland.

Pittsfield — K. S. Kern, 225 bu. certified Chief; 175 bu. uncertified Chief.

Compton — Clarence Ackland, 1,600 bu. certified early Richland, field purity 99.9 pct.

Kansas — Adin Baber, 400 bu. certified Chief.

San Jose — Kelly Seed Co., 2,500 bu. uncertified Illini, 2,200 bu. certified Chief, 1,500 bu. uncertified Chief, 11,500 bu. uncertified Richland, 800 bu. certified Richland.

Rantoul — Harold Zehr, Rt. 1, 500 bu. certified Illini.

Champaign — Maxwell Farms, Rt. 2, 800 bu. certified Chief.

Sidney — Marshall Butzow, 1,000 bu. certified Chief, 450 bu. certified Patoka, 725 bu. uncertified Richland.

Manhattan — Lawrence Meyer, Rt. 1, 1,200 bu. certified Richland.

MINNESOTA

Wood Lake — Neumann's Seeds & Service, John A. Neumann, Mgr., 30 bu. early Minnesota Manchu, Minn. Reg. No. 1 blue tag.

Minneapolis 13 — Twin City Seed Co., 130 2nd St. N. E., carries Pridesoy, Kabott, Minsoy, Mandarin, Habaro, Wis. Manchu No. 606, Minnesota Manchu, New Improved Wis. No. 3 Manchu, and Richland.

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Ringoes — W. Chmielewski, Edible varieties available: Bansei, Etum, Imperial, Funk Delicious, Easycook and Giant Green.

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Maumee — W. N. Woods & Son, Monclova Rd., 300 bu. certified Richland, 500 bu. uncertified Richland.

Franklin — Carl J. Miller & Son, Rt. 1, 150 bu. certified Dunfield.

Delphos — Lawrence W. Adam, Rt. 1, 90 bu. certified Dunfield.

Ada — J. R. Spar, 200 bu. certified Dunfield.

New Weston — John N. Kramer & Sons, Rt. 1, 150 bu. registered Scioto.

IN THE MARKETS

• **SOYBEAN STOCKS, JANUARY 1.** Soybeans stored in all positions, both on and off farms, January 1, 1944 amounted to 168,553,000 bushels, as reported by the Crop Reporting Board, B. A. E. This total includes farm stocks of 58,119,000 bushels, and 36,328,000 bushels stored in interior mills, elevators and warehouses, as estimated by the Crop Reporting Board; 45,436,000 bushels held in processing plants, as enumerated by the Bureau of the Census; 23,719,000 bushels at the 46 terminal markets, according to reports of the War Food Administration; and 4,951,000 bushels reported by Commodity Credit Corporation as stored in their own steel and wooden bins. A year earlier, stocks of soybeans in these same positions totaled 169,677,000 bushels.

In the 3-month period, October 1 to December 31, 1943, a total of 30,354,000 bushels of soybeans had been crushed, according to reports of the Bureau of the Census. In the corresponding period of 1942 crushings had totaled 25,095,000 bushels. This 21 percent increase in crushings, shown in this 1943 quarter over the same quarter of 1942, was approximated in each individual month of the period. Making allowance for seed requirements, and much smaller quantities to be fed on farms this season, it appears that it may be possible to maintain this increase in the processing rate for most of the remainder of the 1943-44 season.

Stocks of Soybeans, January 1, 1944, with comparisons

Position	Reported by:	Jan. 1, 1943	Oct. 1, 1943	Jan. 1, 1944
		Thousand Bushels		
On Farms	Crop Reporting Board	88,215	4,561	58,119
Int. M. E. & W.	Crop Reporting Board	29,505	668	36,328
Processing Plants	Bureau of the Census	34,938	4,763	45,436
Terminal Markets	War Food Admin.	3,519	732	23,719
Steel & Wooden Bins	Commodity Credit Corp.	13,500	1,819	4,951
TOTAL ALL POSITIONS		169,677	12,543	168,553

Stocks of Soybeans in Mills, Elevators, Warehouses and Other Establishments*, January 1, 1944, with comparisons

State	Jan. 1, 1943	Oct. 1, 1943	Jan. 1, 1944	State	Jan. 1, 1943	Oct. 1, 1943	Jan. 1, 1944
	Thousand Bushels				Thousand Bushels		
Ohio	2,670	123	3,580	No. Car.	166	4	100
Indiana	2,325	156	3,730	Mississippi	165	1	105
Illinois	17,500	95	20,080	Arkansas	140	1	102
Michigan	50	50	135	10 States	28,196	571	34,972
Minnesota	271	15	206	Other States	1,309	97	1,356
Iowa	4,039	73	6,332				
Missouri	870	53	602	U. S.	29,505	668	36,328

*Excludes stocks in crushers and processing plants enumerated by the Bureau of Census and stocks at 46 terminal markets reported by the War Food Administration.

• **WAR FOOD ADMINISTRATION PURCHASES.** For Lend-Lease, territorial emergency, Red Cross and other purposes, in pounds.

Commodity	Quantity — December	Quantity — Jan. 1 to Dec. 31, 1943	F.O.B. Cost Jan. 1 to Dec. 31, 1943
Soybean Oil	—	21,783,500	$ 2,890,327
Soybean Meal	—	88,000	2,472
Soybean Pellets	—	400,000	7,450
Soybeans	—	17,104,000	636,912
Soy Flour	99,100,000	219,010,000	10,499,967
Soy Grits	24,000,000	95,050,000	4,024,838

In addition to the purchases reported above, Commodity Credit made available the following for Lend Lease operations:

Soybeans (pounds)	—	41,864,000	$ 1,482,464
Soybean Oil Meal (tons)	1,652	9,806	511,925

• **JANUARY INSPECTIONS.** Inspected receipts of soybeans in January were only about 60 percent of those for December but showed improvement in quality. The January inspections totaled 3,133 cars compared

with 5,603 cars the preceding month. Inspections for the first four months of the season totaled 61,555 cars compared with 37,375 cars for the same period a year ago.

The quality of the soybeans inspected in January was somewhat higher than that for December. Seventy-four percent graded No. 2 or better in January compared with 66 percent in December. Eighty-six percent graded No. 2 or better October through January this season compared with 41 percent for the corresponding months last year.

Inspections of soybeans in January included the equivalent of 98 cars inspected as cargo lots, and truck receipts equivalent to about 51 cars.

• **STOCKS.** War Food Administration reported for February 15, 19,843,915 bu. soybeans in commercial storage compared to 4,120,000 bu. a year ago; Feb. 22, 18,167,986 bu. compared to 4,224,998 same date 1943; Feb. 29, 17,384,750 bu. compared with 3,933,000 same date 1943; March 7, 16,665,255 bu. compared with 3,532,000 same date 1943.

• **STANDARD SHORTENING SHIPMENTS.** By members of Institute of Shortening Mfgrs., Inc.

Week ending February 12, lbs.	6,016,336
Week ending February 19	6,278,695
Week ending February 26	5,899,661

GOVERNMENT ORDERS

• **1943 CROP SOYBEANS CEILING.** The Office of Price Administration with the concurrence of the War Food Administrator has issued a new regulation controlling the price of soybeans of the 1943 crop that are to be processed for oil. The ceiling price for producers of the base grade (U.S. No. 2, 14 percent moisture, yellow and green) is $1.86 per bushel. The ceiling for the highest quality of soybeans is $1.92 per bushel.

This action establishes as the ceiling the Commodity Credit Corporation support prices for the 1943 crop plus six cents per bushel as an allowance for storage and carrying charges. The ceiling for the 1942 crop for soybeans of similar grades remains $1.66 per bushel, including storage charges, under Maximum Price Regulation 331.

In addition, the regulation allows country elevator operators a mark-up three-fourths of a cent higher than last year's maximum of 4¼ cents per bushel for handling various grades of the beans. Also, merchandisers are permitted a ½-cent-per-bushel increase over the maximums established for the 1942 soybean crop.

Soybeans sold as seed for the 1944 crop, or for human consumption, or exported, are not covered by the new ceiling.

• **CONTRACT FULFILLMENT.** Fulfillment of contracts for soybeans of the 1943 crop entered into prior to February 24, 1944, for delivery prior to September 30, 1944, is permitted by the Office of Price Administration in an amendment which became effective simultaneously with the new regulation on soybeans, the OPA announced. February 24 was the date the regulation was issued.

This action, effective March 1, 1944, was taken at the request of the Commodity Credit Corporation, which had encouraged the purchase and storage of soybeans by a few processors in terminal elevators.

The prices in the contracts involved may exceed the maximum price in the soybean regulation (Maximum Price Regulation No. 515 — Soybeans of the 1943 Crop), due to storage and interest charges. However, neither the price of the meal or the oil will be in any way affected. These are covered by other regulations.

• **REFINED OIL PRICES.** The maximum prices recently announced for refined cottonseed oil and refined soybean oil made from 1943-44 crops also apply to oils made from subsequent crops, the Office of Price Administration says.

This announcement represents an elaboration of Amendments 10 and 13 to Maximum Price Regulation No. 53, which did not specifically include crops subsequent to 1943-44.

Inclusion of later crops is now made definite to cover forward selling of these refined oils which will be produced from the 1944-45 cotton and soybean crops.

Growing of soybeans, the processing of oils, and the production of equipment for food processing are included in a revised list of essential activities released February 25.